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Protocol for conducting scoping reviews to map implementation strategies in different care settings— Focusing on evidence-based interventions for pre-selected phenomena in people with dementia.

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Title Page

Title of the manuscript: Protocol for conducting scoping reviews to map implementation strategies in different care settings—Focusing on evidence-based interventions for pre-selected phenomena in people with dementia.

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Abstract

Introduction:

Various evidence-based interventions are available to improve the care of people with dementia in different care settings, many of which are not or are only partially implemented in routine care. Different implementation strategies have been developed to support the implementation of interventions in routine care; however, the implementation of complex interventions remains challenging. The aim of our reviews is to identify promising strategies for, significant facilitators of and barriers to the implementation of evidence-based interventions for very common dementia care phenomena**: a**) behavioural and psychological symptoms of dementia (BPSD) in long-term care, **b**) delirium in acute care, and **c**) the post-acute care needs of people with dementia.

Methods and analysis:

We will conduct one scoping review for each pre-selected dementia care phenomenon (**a**, **b**, and **c**). For this, three literature searches will be carried out in the following electronic databases: MEDLINE (via PubMed), CINAHL (via EBSCO) and PsycInfo (via EBSCO). Additionally, we will perform forward and backward citation tracking via reference lists and Google Scholar. Identified records will be independently screened by two reviewers (title/abstract and full text) using the defined inclusion criteria. We will include all study designs and publications in the German or English language. For the data analyses, we will conduct a deductive content analysis using two different analytical approaches: Expert Recommendations for Implementation Change (ERIC) and the Consolidated Framework for Implementation Research (CFIR).

Ethics and dissemination:

Due to the nature of a review, ethical clearing is not required. We will disseminate our results in peer-reviewed journals, workshops with stakeholders, and (inter)national conferences.

Strengths and limitations of this study

- To our knowledge, our three scoping reviews will, for the first time, map promising strategies for, significant facilitators of and barriers to the implementation of evidence-based interventions for three pre-selected common phenomena in people with dementia.
- We expect that the results of our three scoping reviews will inform practitioners and researchers about various strategies for, facilitators of and barriers to implementation.
- The three scoping reviews are part of a larger study (TransferDem BMG: FKZ 5021FSB001) and are in line with the goal of supporting the development of a blueprint for the successful implementation of interventions.
- This study protocol provides transparency for all three scoping reviews and, furthermore, reduces the likelihood of review bias.
- The main limitation of our reviews is that we will restrict the search to three pre-selected common phenomena in dementia care.

Introduction

International health policy, stakeholders and non-government organizations are responding to the increasing number of people with dementia through national dementia strategies. These national dementia strategies, for example, describe the demands for action and the recommended approaches to improving health care for people with dementia in various care settings; in particular, long-term care and acute care settings should be given priority.[1-3] This priority is partly because care for people with dementia often presents challenges for healthcare professionals[4], which then leads to poor care outcomes.[5] Due to the high prevalence[6 7] and associated negative consequences[8-12] for people with dementia, their relatives and healthcare professionals, behavioural and psychological symptoms of dementia (BPSD), delirium and post-acute care needs are particularly relevant phenomena in the care of people with dementia. To optimize care, various interventions addressing these phenomena have been developed and evaluated.[13-17]

Study results show that despite the increasing number of evidence-based interventions, patients receive only 30-40% of their care in line with the current scientific evidence, and in 20-25% of patients, there is a risk of harm in care.[18] Additionally, health care professionals report that they implement research findings relatively seldomly in their care routines.[19] This means that there is currently a gap between the existence of evidence-based interventions and their successful implementation in routine care. To improve the care of people with dementia in different settings, it seems to be necessary to focus on promising implementation strategies for evidence-based interventions. Implementation strategies for evidence-based interventions for people with dementia appear to be complex and extensive.[20] Various factors for successful implementation seem to be required.[21 22]

To our knowledge, there is no comprehensive, systematized evidence on implementation strategies for evidence-based interventions for specific care phenomena in people with dementia. With our three scoping reviews, we aim to identify promising implementation strategies for evidence-based interventions that focus on three pre-selected phenomena in people with symptoms of or who have been diagnosed with dementia: **a**) BPSD in long-term care, **b**) delirium in acute care, and **c**) post-acute care needs. In addition, barriers and facilitators that influence the implementation of the different interventions will be identified.

Method

In this article, we report the protocol used for all three scoping reviews because all reviews are part of a larger study (TransferDem), and the results will be synthesized and used in later steps of this study. In line with our research aim, we defined the following research questions:

1. Which implementation strategies are promising for the implementation of evidence-based interventions for three pre-selected phenomena: a) BPSD in long-term care, b) delirium in acute care and c) post-acute care needs?
2. What are the significant facilitators and barriers that influence the implementation of evidence-based interventions?
3. What are the effects of these implementation strategies on implementation outcomes?

To answer our research questions, we will conduct three scoping reviews starting in March 2021 that are scheduled to end in December 2021. Each scoping review will address question 1 for one of the three pre-selected phenomena (**a**, **b** or **c**) and will address questions 2 and 3.

Scoping reviews are meant to map, for example, the available evidence in a given field, to examine how research is conducted in a certain field and to identify knowledge gaps.[23] We will follow the Joanna Briggs Institute approach to scoping studies developed by Peters, et al. [24] The approach includes the following nine steps: 1) defining and aligning the objective/s and question/s, 2) developing and aligning the inclusion criteria with the objective/s and question/s, 3) describing the planned approach to searches for evidence, the selection of records, data extraction, and the presentation of the evidence, 4) searching for the evidence, 5) selecting the evidence, 6) extracting the evidence, 7) analysing the evidence, 8) presenting the results and 9) summarizing the evidence in relation to the purpose of the review, drawing conclusions and noting any implications of the findings.

To report the review protocol, we follow, whenever applicable, the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines[25] (supplementary table 1).

Inclusion criteria

Our inclusion criteria are based on our research aims and questions. We report these inclusion criteria by using the "PCC" mnemonic.[24] Additionally, we report the criteria for the types of evidence sources and other criteria (table 1).

Table 1: Inclusion criteria

Criteria	Definition
Population	▪ People with symptoms of dementia (with and without a dementia/an Alzheimer's diagnosis) as the target population for the evidence-based interventions
Concept of Interest	▪ Implementation of evidence-based: a) interventions for BPSD b) interventions for delirium c) interventions for post-acute care needs
Context	a) long-term care b) acute care c) acute care
Types of evidence sources	▪ Any kind of study that describes or evaluates the implementation process
Other	▪ Languages: German and English ▪ Year: no restrictions

Search strategies

We conducted one literature search for evidence-based interventions addressing each type of pre-selected phenomenon (**a**, **b**, and **c**) in the following electronic databases: MEDLINE (via PubMEd), CINAHL (via EBSCO) and PsycInfo (via EBSCO). The search terms were derived from our research questions. Additionally, we used an initial limited search and key publications to identify free search terms and indexing words. These search terms were clustered according to the "PCC" mnemonic[24] and resulted in three search strings. The search strings were developed by the first reviewers of each review (**a** and **b**: MRM; **c**: CM) and were checked by the second reviewers (**a** and **b**: JB; **c**: DP) using Peer Review of Electronic Search Strategies (PRESS).[26] The search strings were developed first for MEDLINE (via PubMed) (supplementary table 2) and then adopted for the other two databases with RefHunter Vers. 5.0.[27] Additionally, we will perform forward and backward citation tracking (via reference lists and Google Scholar).

Selection of evidence sources

Records identified through our literature searches (**a**, **b**, **c**) will be imported under separate Covidence[28] licences and automatically checked for duplicates. Titles and abstracts of records for each review will be screened by two reviewers (**a** and **b**: MRM/JB; **c**: CM/DP) independently against the inclusion criteria. Thereafter, the full text of all potentially relevant records will also be independently screened for inclusion by the same reviewers. The reasons for excluding full texts will be recorded. During the screening process, disagreements between the votes of the two reviewers will be resolved through a discussion between them or, if no consensus can be reached, through a discussion with all co-authors. The first 25 records will used to pilot test our inclusion criteria for each review, and the criteria will be adjusted if necessary. Adjustments will be required if the number of vote discrepancies between the two reviewers are greater than 25 %.[24] If adjustments for inclusion criteria are made during the screening process, we will report them in our following publications. We will use the PRISMA flowchart[29] to report the process for evidence selection.

Data extraction

For data extraction, we will adapt the template for scoping reviews developed by the Joanna Briggs Institute (table 2).[24] Data extraction will be conducted for each review by two reviewers (**a**, **b**: MRM/JB; **c**: CM/DP) independently in Covidence.[28] After finishing the extraction process, every extracted item will be checked for deviations. Deviations will be discussed, and if no consensus between the two researchers can be reached, the research team will become involved. The data extraction will be performed with an iterative process according to the description from the Joanna Briggs Institute[24], which means that after two studies are extracted, the template will be checked to see whether all relevant data are represented or whether adjustments are needed.

Table 2: Data extraction template

Domain	Description (Content)
General Information	▪ Author (complete name) ▪ Country (location of the study) ▪ Year (publication date) ▪ Aim (e.g., effectiveness of different implementation strategies) ▪ Study design (e.g., process evaluation) ▪ Setting (e.g., type, number of facilities, size of facilities)
Participants	▪ Target population for the intervention (e.g., people with symptoms of dementia or diagnosed dementia) ▪ Participants of the implementation/process evaluation (e.g., nursing staff)

Intervention	▪ Implemented intervention (e.g., content, components, providers)
Implementation and Evaluation	▪ Description of the implementation (e.g., theoretical framework, strategies, materials) ▪ Description of the evaluation of the implementation (e.g., methods)
Results	▪ Main findings of the implementation (e.g., outcomes according to Proctor, et al. [30]) ▪ Main findings of the evaluation of the implementation (e.g., barriers, facilitators)

Analysis of the evidence

We will apply deductive content analysis to analyse the strategies for, barriers to and facilitators of implementation reported within the included studies. The deductive categories used for the analysis of the implementation strategies will be derived from the Expert Recommendations for Implementing Change (ERIC) (supplementary table 3).[31-33] In addition, the five dimensions of the Consolidated Framework for Implementation Research (CFIR)[34] (supplementary table 4) and their sub-concepts will be used to analyse the reported factors (barriers and facilitators), which influencing implementation success. This approach has been shown to be applicable in a previous study.[35]

First, the included studies for each review will be independently coded by two reviewers (**a** and **b**: MRM/JB; **c**: CM/DP) in MAXQDA Vers. 2020.[36] Second, the codings of the two reviewers for each review will be compared and, in the case of deviations, discussed. Third, a recoding process based on the results of the comparison will be carried out, and codes will be counted. If a code cannot be clearly assigned, a discussion with all co-authors will be initiated. Fourth, excerpts from the results of the deductive content analysis will be peer checked by one of two researchers (MR, TQ) to ensure trustworthiness.[37]

Presentation of the results

The results of the three reviews will be reported and presented separately both narratively and visually. For this, we will create a table to describe the characteristics of the included studies (table 2). Additionally, we will report the results of the implementation and evaluation in a narrative form. The results of our content analysis will be presented in an appropriate narrative and/or visual form (e.g., tables or figures).

Patient and public involvement

The three scoping reviews are the foundation for a larger study (TransferDem) in Germany. The results of the reviews will be used to:

- conduct a market analysis to investigate implementation strategies for evidence-based interventions in different care settings,
- conduct interviews with stakeholders to investigate the facilitators of and barriers to the implementation of evidence-based interventions,
- apply a foresight model for implementation strategies for evidence-based interventions, and
- develop a framework to guide implementation.

Ethics and dissemination

Because of the nature of scoping reviews, ethical approval is not required. However, we will apply for ethical approval for TransferDem, which includes the three scoping reviews, from the University of Witten/Herdecke in April 2021. The results of our scoping reviews will be published in peer-reviewed journals. Furthermore, we will disseminate our results in workshops with stakeholders and at international conferences.

Contributors

CM, TQ, MRM and JB wrote the initial draft of the protocol. DP and MR revised the manuscript. All authors read and approved the final manuscript. MR and TQ conducted the larger study TransferDem.

Funding statement

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Competing interests

None

Patient consent for publication

None required

Ethics approval

None required

Supplementary table 1: PRISMA-P Checklist

Section and topic	Item No	Checklist item	Reported on page no.
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	-
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	-
Authors:			
Contact	3a	Provide name, institutional affiliation, and e-mail address of all protocol authors; provide physical mailing address of corresponding author	1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	9
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	-
Support:			
Sources	5a	Indicate sources of financial or other support for the review	9
Sponsor	5b	Provide name for the review funder and/or sponsor	9
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	-
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	4
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	4-5
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	6
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	6

Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	6, 12-14
Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	6-7
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	7
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	7-8
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	7-8
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	-
Risk of bias in individual studies	14	Describe anticipated methods for assessing the risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	-
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	8
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	-
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	-
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	-
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	-
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	-

From: Shamseer, et al. [25]

Supplementary table 2: Example search strategies for MEDLINE (via PubMed)

Population	#1 Dementia[MeSH] #2 Dement*[T/A] #3 Alzheimer*[T/A] #4 Cognitive impairment* [T/A] #5 OR/ #1-4
Concept	#6 DICE[T/A] #7 Triangle[T/A] #8 Person-cent*[T/A] #9 "Person cent*"[T/A] #10 Client-cent*[T/A] #11 "Client cent*"[T/A] #12 Resident-cent*[T/A] #13 "Resident cent*"[T/A] #14 Patient-cent*[T/A] #15 "Patient cent*"[T/A] #16 "DICE approach"[T/A] #17 OR/ #6-16 #18 BPSD[T/A] #19 Behaviour*[T/A] #20 Behavior*[T/A] #21 Challenging behavior*[T/A] #22 Apathy [T/A] #23 Vocalization [T/A] #24 "Resistance to care"[T/A] #25 Resisting care[T/A] #26 Psychogeriat*[T/A] #27 Gerontopsy*[T/A] #28 "Behavioral Symptoms"[MeSH] #29 "Behavioral Symptoms"[T/A] #30 "Behavioural Symptoms"[T/A] #31 "Behavioral and Psychological Symptoms of Dementia"[T/A] #32 "Behavioural and Psychological Symptoms of Dementia"[T/A] #33 Aggression[T/A] #34 Agitation[T/A] #35 OR/ #18-34 #36 #17 AND #35 #37 Implement*[T/A] #38 Health plan implementation[MeSH] #39 Implementation Science [MeSH] #40 "Quality improvement*"[T/A] #41 Quality improvement[MeSH] #42 Diffused[T/A] #43 diffusion[T/A] #44 Diffusion of innovation[MeSH] #45 "Knowledge translation*"[T/A] #46 "Knowledge exchange"[T/A] #47 "Knowledge circulation"[T/A] #48 Facilitators[T/A] #49 Barriers[T/A] #50 "Process evaluation*"[T/A] #51 "Formative evaluation*"[T/A] #52 "Summative evaluation*"[T/A] #53 "Qualitative evaluation*"[T/A] #54 Sustainability[T/A] #55 Practicability[T/A] #56 Feasibility[T/A] #57 Fidelity[T/A] #58 Maintenance[T/A] #59 Adopt*[T/A] #60 Integrat*[T/A] #61 Disseminat*[T/A] #62 Promot*[T/A] #63 OR/ #37-62 #64 #36 AND #63
Context	#65 Long term care[MeSH] #66 Residential facilities[MeSH] #67 Skilled nursing facilities[MeSH] #68 Residential facilit*[T/A]

	#69 Skilled nursing facilit*[T/A] #70 Nursing home*[T/A] #71 Homes for the aged[T/A] #72 Care home*[T/A] #73 Long term care[T/A] #74 Short term care[T/A] #75 OR/ #65-74 #76 #5 AND #64 AND #75

Population	#1 Dementia[MeSH] #2 Dement*[T/A] #3 Alzheimer*[T/A] #4 Cognitive impairment*[T/A] #5 OR/ #1-4
Concept	#6 Delirium[MeSH] #7 Delir*[T/A] #8 "Delirium superimposed on dementia"[T/A] #9 DSD[T/A] #10 OR/ #6-9 #11 Prevention[T/A] #12 Identification[T/A] #13 Screen*[T/A] #14 Assessment[T/A] #15 Instrument[T/A] #16 "Delirium management"[T/A] #17 Management[T/A] #18 Guidelines[T/A] #19 OR/ #11-18 #20 #10 AND #19 #21 Implement*[T/A] #22 Health plan implementation[MeSH] #23 Implementation Science [MeSH] #24 "Quality improvement*"[T/A] #25 Quality improvement[MeSH] #26 Diffused[T/A] #27 diffusion[T/A] #28 Diffusion of innovation[MeSH] #29 "Knowledge translation*"[T/A] #30 "Knowledge exchange"[T/A] #31 "Knowledge circulation"[T/A] #32 Facilitators[T/A] #33 Barriers[T/A] #34 "Process evaluation*"[T/A] #35 "Formative evaluation*"[T/A] #36 "Summative evaluation*"[T/A] #37 "Qualitative evaluation*"[T/A] #38 Sustainability[T/A] #39 Practicability[T/A] #40 Feasibility[T/A] #41 Fidelity[T/A] #42 Maintenance[T/A] #43 Adopt*[T/A] #44 Integrat*[T/A] #45 Disseminat*[T/A] #46 Promot*[T/A] #47 OR/ #21-46 #48 #20 AND #47
Context	#49 Hospitals[MeSH] #50 Hospital*[T/A] #51 "Emergency Service, Hospital"[MeSH] #52 ER[T/A] #53 Emergency room[T/A] #54 Emergency department[T/A] #55 ED #56 "Acute care"[T/A] #57 "Acute setting"[T/A] #58 Inpatient[T/A] #59 Inpatient setting[T/A] #60 Secondary Care[T/A]

	#61 Clinic[T/A] #62 OR/ #49-61 #63 #5 AND #48 AND #62

Population	#1 Dementia[MeSH] #2 Dement*[T/A] #3 Alzheimer*[T/A] #4 Cognitive impairment*[T/A] #5 OR/ #1-4
Concept	#6 Transitional Care[MeSH] #7 Transitional care[T/A] #8 Transitional care model[T/A] #9 TCM[T/A] #10 Transition*[T/A] #11 Care coordination[T/A] #12 Discharge management[T/A] #13 Continuity of Patient care [MeSH] #14 OR/ #6-13 #15 Implement*[T/A] #16 Health plan implementation[MeSH] #17 Implementation Science [MeSH] #18 "Quality improvement*"[T/A] #19 Quality improvement[MeSH] #20 Diffused[T/A] #21 Diffusion[T/A] #22 Diffusion of innovation[MeSH] #23 "Knowledge translation*"[T/A] #24 "Knowledge exchange"[T/A] #25 "Knowledge circulation"[T/A] #26 Facilitators[T/A] #27 Barriers[T/A] #28 "Process evaluation*"[T/A] #29 "Formative evaluation*"[T/A] #30 "Summative evaluation*"[T/A] #31 "Qualitative evaluation*"[T/A] #32 Sustainability[T/A] #33 Practicability[T/A] #34 Feasibility[T/A] #35 Fidelity[T/A] #36 Maintenance[T/A] #37 Adopt*[T/A] #38 Integrat*[T/A] #39 Disseminat*[T/A] #40 Promot*[T/A] #41 OR/ #15-40 #42 #14 AND #41
Context	#43 Hospitals[MeSH] #44 Hospital*[T/A] #45 Acute care [T/A] #46 Acute setting*[T/A] #47 Inpatient[T/A] #48 Inpatient setting[T/A] #49 Post acute[T/A] #50 Post acute setting[T/A] #51 Secondary care[T/A] #52 Clinic[T/A] #53 OR/ #43-52 #54 #5 AND #42 AND #53

Supplementary table 3: Coding categories for implementation strategies, ERIC[31-33]

Categories	Subcategories
Use evaluative and iterative strategies	▪ Assess for readiness and identify barriers and facilitators ▪ Audit and provide feedback ▪ Purposefully reexamine the implementation ▪ Develop and implement tools for quality monitoring ▪ Develop and organize quality monitoring systems ▪ Develop a formal implementation blueprint ▪ Conduct local need assessment ▪ Stage implementation scale up ▪ Obtain and use patients/consumers and family feedback ▪ Conduct cyclical small tests of change
Provide interactive assistance	▪ Facilitation ▪ Provide local technical assistance ▪ Provide clinical supervision ▪ Centralize technical assistance
Adapt and tailor to context	▪ Tailor strategies ▪ Promote adaptability ▪ Use data experts ▪ Use data warehousing techniques
Develop stakeholder interrelationships	▪ Identify and prepare champions ▪ Organize clinician implementation team meetings ▪ Recruit, designate, and train for leadership ▪ Inform local opinion leaders ▪ Build a coalition ▪ Obtain formal commitments ▪ Identify early adopters ▪ Conduct local consensus discussions ▪ Capture and share local knowledge ▪ Use advisory boards and workgroups ▪ Use an implementation advisor ▪ Model and simulate change ▪ Visit other sites ▪ Involve executive boards ▪ Develop an implementation glossary ▪ Develop academic partnerships ▪ Promote network weaving
Train and educate stakeholders	▪ Conduct ongoing training ▪ Provide ongoing consultation ▪ Develop educational materials ▪ Make training dynamic ▪ Distribute educational materials ▪ Use train-the-trainer strategies ▪ Conduct educational meetings ▪ Conduct educational outreach visits ▪ Create a learning collaborative ▪ Shadow other experts ▪ Work with educational institutions

Support clinicians	▪ Facilitate relay of clinical data to providers ▪ Remind clinicians ▪ Develop resource sharing agreements ▪ Revise professional roles ▪ Create new clinical teams
Engage consumers	▪ Involve patients/consumers and family members ▪ Intervene with patients/consumers to enhance uptake and adherence ▪ Prepare patients/consumers to be active participants ▪ Increase demand ▪ Use mass media
Utilize financial strategies	▪ Fund and contract for the clinical innovation ▪ Access new funding ▪ Place innovation on fee for service lists/formularies ▪ Alter incentive/allowance structures ▪ Make billing easier ▪ Alter patient/consumer fees ▪ Use other payment schemes ▪ Develop disincentives ▪ Use capitated payments
Change infrastructure	▪ Mandate change ▪ Change record systems ▪ Change physical structure and equipment ▪ Create or change credentialing and/or licensure standards ▪ Change service sites ▪ Change accreditation or membership requirements ▪ Start a dissemination organization ▪ Change liability laws

Supplementary table 4: Coding categories for potential factors influencing the implementation processes, CFIR[34]

Categories	Subcategories
Intervention characteristics	▪ Intervention source ▪ Evidence strength and quality ▪ Relative advantage ▪ Adaptability ▪ Trialability ▪ Complexity ▪ Design quality and packaging ▪ Cost
Outer setting	▪ Patient needs and resources ▪ Cosmopolitanism ▪ Peer pressure ▪ External policy and incentives
Inner setting	▪ Structural characteristics ▪ Networks and communications ▪ Culture ▪ Implementation climate ▪ Tension for change ▪ Compatibility ▪ Relative priority ▪ Organizational incentives and rewards ▪ Goals and feedback ▪ Learning climate ▪ Readiness for implementation ▪ Leadership engagement ▪ Available resources ▪ Access to knowledge and information
Characteristics of individuals	▪ Knowledge and beliefs about the intervention ▪ Self-efficacy ▪ Individual stage of change ▪ Individual identification with organization ▪ Other personal attributes
Process	▪ Planning ▪ Engaging ▪ Opinion leaders ▪ Formally appointed internal implementation leaders ▪ Champions ▪ External change agents ▪ Executing ▪ Reflecting and Evaluating

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Title Page

Title of the manuscript: Protocol for conducting scoping reviews to map implementation strategies in different care settings—Focusing on evidence-based interventions for pre-selected phenomena in people with dementia.

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Abstract

Introduction:

Various evidence-based interventions are available to improve the care of people with dementia in different care settings, many of which are not or are only partially implemented in routine care. Different implementation strategies have been developed to support the implementation of interventions in routine care; however, the implementation of complex interventions remains challenging. The aim of our reviews is to identify promising strategies for, significant facilitators of and barriers to the implementation of evidence-based interventions for very common dementia care phenomena**: a**) behaviour that challenges supporting a person with dementia in long-term care, **b**) delirium in acute care, and **c**) the post-acute care needs of people with dementia.

Methods and analysis:

We will conduct one scoping review for each pre-selected dementia care phenomenon (**a**, **b**, and **c**). For this, three literature searches will be carried out in the following electronic databases: MEDLINE (via PubMed), CINAHL (via EBSCO) and PsycInfo (via EBSCO). Additionally, we will perform forward and backward citation tracking via reference lists and Google Scholar. Identified records will be independently screened by two reviewers (title/abstract and full text) using the defined inclusion criteria. We will include all study designs and publications in the German or English language. For the data analyses, we will conduct a deductive content analysis using two different analytical approaches: Expert Recommendations for Implementation Change (ERIC) and the Consolidated Framework for Implementation Research (CFIR).

Ethics and dissemination:

Due to the nature of a review, ethical clearing is not required. We will disseminate our results in peer-reviewed journals, workshops with stakeholders, and (inter)national conferences.

Strengths and limitations of this study

- To our knowledge, our three scoping reviews will, for the first time, map promising strategies for, significant facilitators of and barriers to the implementation of evidence-based interventions for three pre-selected common phenomena in people with dementia.
- We expect that the results of our three scoping reviews will inform practitioners and researchers about various strategies for, facilitators of and barriers to implementation.
- The three scoping reviews are part of a larger study (TRANSFER-DEM BMG: FKZ 5021FSB001) and are in line with the goal of supporting the development of a blueprint for the successful implementation of interventions.
- This study protocol provides transparency for all three scoping reviews and, furthermore, reduces the likelihood of review bias.
- The main limitation of our reviews is that we will restrict the search to three pre-selected common phenomena in dementia care.

Introduction

International health policy, stakeholders and non-government organizations are responding to the increasing number of people with dementia through national dementia strategies. These national dementia strategies, for example, describe the demands for action and the recommended approaches to improving health care for people with dementia in various care settings; in particular, long-term care and acute care settings should be given priority.[1-3] This priority is partly because care for people with dementia often presents challenges for healthcare professionals[4], which then leads to poor care outcomes.[5] Due to the high prevalence[6 7] and associated negative consequences[8-12] for people with dementia, their relatives and healthcare professionals, behaviour that challenges supporting a person with dementia, delirium and post-acute care needs are particularly relevant phenomena in the care of people with dementia. To optimize care, various interventions addressing these phenomena have been developed and evaluated.[13-17]

Study results show that despite the increasing number of evidence-based interventions, patients receive only 30-40% of their care in line with the current scientific evidence, and in 20-25% of patients, there is a risk of harm in care.[18] Additionally, health care professionals report that they implement research findings relatively seldomly in their care routines.[19] This means that there is currently a gap between the existence of evidence-based interventions and their successful implementation in routine care. To improve the care of people with dementia in different settings, it seems to be necessary to focus on promising implementation strategies for evidence-based interventions. Implementation strategies for evidence-based interventions for people with dementia appear to be complex and extensive.[20] Various factors for successful implementation seem to be required.[21 22]

To our knowledge, there is no comprehensive, systematized evidence on implementation strategies for evidence-based interventions for specific care phenomena in people with dementia. With our three scoping reviews, we aim to identify promising implementation strategies for evidence-based interventions that focus on three pre-selected phenomena in people with symptoms of or who have been diagnosed with dementia: **a**) behaviour that challenges supporting a person with dementia in long-term care, **b**) delirium in acute care, and **c**) post-acute care needs. In addition, barriers and facilitators that influence the implementation of the different interventions will be identified.

Method

In this article, we report the protocol used for all three scoping reviews because all reviews are part of a larger study (TRANSFER-DEM), and the results will be synthesized and used in later steps of this study. In line with our research aim, we defined the following research questions:

1. Which implementation strategies are promising for the implementation of evidence-based interventions for three pre-selected phenomena: a) behaviour that challenges supporting a person with dementia in long-term care, b) delirium in acute care and c) post-acute care needs?
2. What are the significant facilitators and barriers that influence the implementation of evidence-based interventions?
3. What are the effects of these implementation strategies on implementation outcomes?

To answer our research questions, we will conduct three scoping reviews starting in March 2021 that are scheduled to end in December 2021. Each scoping review will address question 1 for one of the three pre-selected phenomena (**a**, **b** or **c**) and will address questions 2 and 3.

Scoping reviews are meant to map, for example, the available evidence in a given field, to examine how research is conducted in a certain field and to identify knowledge gaps.[23] We will follow the Joanna Briggs Institute approach to scoping studies developed by Peters, et al. [24] The approach includes the following nine steps: 1) defining and aligning the objective/s and question/s, 2) developing and aligning the inclusion criteria with the objective/s and question/s, 3) describing the planned approach to searches for evidence, the selection of records, data extraction, and the presentation of the evidence, 4) searching for the evidence, 5) selecting the evidence, 6) extracting the evidence, 7) analysing the evidence, 8) presenting the results and 9) summarizing the evidence in relation to the purpose of the review, drawing conclusions and noting any implications of the findings.

To report the review protocol, we follow, whenever applicable, the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines[25] (supplementary table 1).

Inclusion criteria

Our inclusion criteria are based on our research aims and questions. We report these inclusion criteria by using the "PCC" mnemonic.[24] Additionally, we report the criteria for the types of evidence sources and other criteria (table 1).

Table 1: Inclusion criteria

Criteria	Definition
Population	▪ People with symptoms of dementia (with and without a dementia/an Alzheimer's diagnosis) as the target population for the evidence-based interventions
Concept of Interest	▪ Implementation of evidence-based: a) Psychosocial interventions for behaviour that challenges supporting a person with dementia b) Psychosocial interventions for delirium c) interventions for post-acute care needs
Context	a) long-term care b) acute care c) acute care
Types of evidence sources	▪ Any kind of study that describes or evaluates the implementation process of interventions (e.g. within the context of trials such as RCT or hybrid design) or daily practice.
Other	▪ Languages: German and English ▪ Year: no restrictions

Search strategies

We conducted one literature search for evidence-based interventions addressing each type of pre-selected phenomenon (**a**, **b**, and **c**) in the following electronic databases: MEDLINE (via PubMed), CINAHL (via EBSCO) and PsycInfo (via EBSCO). The search terms were derived from our research questions. Additionally, we used an initial limited search and key publications to identify free search terms and indexing words. These search terms were clustered according to the "PCC" mnemonic[24] and resulted in three search strings. The search strings were developed by the first reviewers of each review (**a** and **b**: MRM; **c**: CM) and were checked by the second reviewers (**a** and **b**: JB; **c**: DP) using Peer Review of Electronic Search Strategies (PRESS).[26] The search strings were developed first for MEDLINE (via PubMed) (supplementary table 2) and then adopted for the other two databases with RefHunter Vers. 5.0.[27] Additionally, we will perform forward and backward citation tracking (via reference lists and Google Scholar).

Selection of evidence sources

Records identified through our literature searches (**a**, **b**, **c**) will be imported under separate Covidence[28] licences and automatically checked for duplicates. Titles and abstracts of records for each review will be screened by two reviewers (**a** and **b**: MRM/JB; **c**: CM/DP) independently against the inclusion criteria. Thereafter, the full text of all potentially relevant records will also be independently screened for inclusion by the same reviewers. The reasons for excluding full texts will be recorded. During the screening process, disagreements between the votes of the two reviewers will be resolved through a discussion between them or, if no consensus can be reached, through a discussion with all co-authors. The first 25 records will used to pilot test our inclusion criteria for each review, and the criteria will be adjusted if necessary. Adjustments will be required if the number of vote discrepancies between the two reviewers are greater than 25 %.[24] If adjustments for inclusion criteria are made during the screening process, we will report them in our following publications. We will use the PRISMA flowchart[29] to report the process for evidence selection.

Data extraction

For data extraction, we will adapt the template for scoping reviews developed by the Joanna Briggs Institute (table 2).[24] Data extraction will be conducted for each review by two reviewers (**a**, **b**: MRM/JB; **c**: CM/DP) independently in Covidence.[28] After finishing the extraction process, every extracted item will be checked for deviations. Deviations will be discussed, and if no consensus between the two researchers can be reached, the research team will become involved. The data extraction will be performed with an iterative process according to the description from the Joanna Briggs Institute[24], which means that after two studies are extracted, the template will be checked to see whether all relevant data are represented or whether adjustments are needed.

Table 2: Data extraction template

Domain	Description (Content)
General Information	▪ Author (complete name) ▪ Country (location of the study) ▪ Year (publication date) ▪ Aim (e.g., effectiveness of different implementation strategies) ▪ Study design (e.g., RCT, process evaluation) ▪ Setting (e.g., type, number of facilities, size of facilities)

Participants	▪ Target population for the intervention (e.g., people with symptoms of dementia or diagnosed dementia) ▪ Participants of the implementation/process evaluation (e.g., nursing staff)
Intervention	▪ Implemented intervention (e.g., content, components, providers)
Implementation and Evaluation	▪ Description of the implementation (e.g., theoretical framework, strategies, materials) ▪ Description of the evaluation of the implementation (e.g., methods)
Results	▪ Main findings of the implementation (e.g., outcomes according to Proctor, et al. [30]) ▪ Main findings of the evaluation of the implementation (e.g., barriers, facilitators)

Analysis of the evidence

We will apply deductive content analysis to analyse the strategies for, barriers to and facilitators of implementation reported within the included studies. The deductive categories used for the analysis of the implementation strategies will be derived from the Expert Recommendations for Implementing Change (ERIC) (supplementary table 3).[31-33] In addition, the five dimensions of the Consolidated Framework for Implementation Research (CFIR)[34] (supplementary table 4) and their sub-concepts will be used to analyse the reported factors (barriers and facilitators), which influencing implementation success. This approach has been shown to be applicable in a previous study.[35]

First, the included studies for each review will be independently coded by two reviewers (**a** and **b**: MRM/JB; **c**: CM/DP) in MAXQDA Vers. 2020.[36] Second, the coding's of the two reviewers for each review will be compared and, in the case of deviations, discussed. Third, a recoding process based on the results of the comparison will be carried out, and codes will be counted. If a code cannot be clearly assigned, a discussion with all co-authors will be initiated. Fourth, excerpts from the results of the deductive content analysis will be peer checked by one of two researchers (MR, TQ) to ensure trustworthiness.[37]

Presentation of the results

The results of the three reviews will be reported and presented separately both narratively and visually. For this, we will create a table to describe the characteristics of the included studies (table 2). Additionally, we will report the results of the implementation and evaluation in a narrative form. The results of our content analysis will be presented in an appropriate narrative and/or visual form (e.g., tables or figures).

Patient and public involvement

The three scoping reviews are the foundation for a larger study (TRANSFER-DEM) in Germany. The results of the reviews will be used to:

- conduct a market analysis to investigate implementation strategies for evidence-based interventions in different care settings,
- conduct interviews with stakeholders to investigate the facilitators of and barriers to the implementation of evidence-based interventions,
- apply a foresight model for implementation strategies for evidence-based interventions, and
- develop a framework to guide implementation.

Ethics and dissemination

Because of the nature of scoping reviews, ethical approval is not required. However, ethical approval is needed for the lager study TRANSFER-DEM, we therefore will seek ethical approval from the ethic committee of the University of Witten/Herdecke in summer 2021. The results of our scoping reviews will be published in peer-reviewed journals. Furthermore, we will disseminate our results in workshops with stakeholders and at international conferences.

Contributors

CM, TQ, MRM and JB wrote the initial draft of the protocol. DP and MR revised the manuscript. All authors read and approved the final manuscript. MR and TQ conducted the larger study TRANSFER-DEM.

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Competing interests

None

Patient consent for publication

None required

Ethics approval

None required

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Supplementary table 1: PRISMA-P Checklist

Section and topic	Item No	Checklist item	Reported on page no.
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	-
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	-
Authors:			
Contact	3a	Provide name, institutional affiliation, and e-mail address of all protocol authors; provide physical mailing address of corresponding author	1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	9
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	-
Support:			
Sources	5a	Indicate sources of financial or other support for the review	9
Sponsor	5b	Provide name for the review funder and/or sponsor	9
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	-
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	4
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	4-5
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	6
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	6

Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	6, 12-14
Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	6-7
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	7
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	7-8
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	7-8
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	-
Risk of bias in individual studies	14	Describe anticipated methods for assessing the risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	-
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	8
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	-
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	-
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	-
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	-
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	-

From: Shamseer, et al. [25]

Supplementary table 2: Example search strategies for MEDLINE (via PubMed)

Population	#1 Dementia[MeSH] #2 Dement*[T/A] #3 Alzheimer*[T/A] #4 Cognitive impairment* [T/A] #5 OR/ #1-4
Concept	#6 DICE[T/A] #7 Triangle[T/A] #8 Person-cent*[T/A] #9 "Person cent*"[T/A] #10 Client-cent*[T/A] #11 "Client cent*"[T/A] #12 Resident-cent*[T/A] #13 "Resident cent*"[T/A] #14 Patient-cent*[T/A] #15 "Patient cent*"[T/A] #16 "DICE approach"[T/A] #17 OR/ #6-16 #18 BPSD[T/A] #19 Behaviour*[T/A] #20 Behavior*[T/A] #21 Challenging behavior*[T/A] #22 Apathy [T/A] #23 Vocalization [T/A] #24 "Resistance to care"[T/A] #25 Resisting care[T/A] #26 Psychogeriat*[T/A] #27 Gerontopsy*[T/A] #28 "Behavioral Symptoms"[MeSH] #29 "Behavioral Symptoms"[T/A] #30 "Behavioural Symptoms"[T/A] #31 "Behavioral and Psychological Symptoms of Dementia"[T/A] #32 "Behavioural and Psychological Symptoms of Dementia"[T/A] #33 Aggression[T/A] #34 Agitation[T/A] #35 OR/ #18-34 #36 #17 AND #35 #37 Implement*[T/A] #38 Health plan implementation[MeSH] #39 Implementation Science [MeSH] #40 "Quality improvement*"[T/A] #41 Quality improvement[MeSH] #42 Diffused[T/A] #43 diffusion[T/A] #44 Diffusion of innovation[MeSH] #45 "Knowledge translation*"[T/A] #46 "Knowledge exchange"[T/A] #47 "Knowledge circulation"[T/A] #48 Facilitators[T/A] #49 Barriers[T/A] #50 "Process evaluation*"[T/A] #51 "Formative evaluation*"[T/A] #52 "Summative evaluation*"[T/A] #53 "Qualitative evaluation*"[T/A] #54 Sustainability[T/A] #55 Practicability[T/A] #56 Feasibility[T/A] #57 Fidelity[T/A] #58 Maintenance[T/A] #59 Adopt*[T/A] #60 Integrat*[T/A] #61 Disseminat*[T/A] #62 Promot*[T/A] #63 OR/ #37-62 #64 #36 AND #63
Context	#65 Long term care[MeSH] #66 Residential facilities[MeSH] #67 Skilled nursing facilities[MeSH] #68 Residential facilit*[T/A] #69 Skilled nursing facilit*[T/A] #70 Nursing home*[T/A]

	#71 Homes for the aged[T/A] #72 Care home*[T/A] #73 Long term care[T/A] #74 Short term care[T/A] #75 OR/ #65-74 #76 #5 AND #64 AND #75

Population	#1 Dementia[MeSH] #2 Dement*[T/A] #3 Alzheimer*[T/A] #4 Cognitive impairment*[T/A] #5 OR/ #1-4
Concept	#6 Delirium[MeSH] #7 Delir*[T/A] #8 "Delirium superimposed on dementia"[T/A] #9 DSD[T/A] #10 OR/ #6-9 #11 Prevention[T/A] #12 Identification[T/A] #13 Screen*[T/A] #14 Assessment[T/A] #15 Instrument[T/A] #16 "Delirium management"[T/A] #17 Management[T/A] #18 Guidelines[T/A] #19 OR/ #11-18 #20 #10 AND #19 #21 Implement*[T/A] #22 Health plan implementation[MeSH] #23 Implementation Science [MeSH] #24 "Quality improvement*"[T/A] #25 Quality improvement[MeSH] #26 Diffused[T/A] #27 diffusion[T/A] #28 Diffusion of innovation[MeSH] #29 "Knowledge translation*"[T/A] #30 "Knowledge exchange"[T/A] #31 "Knowledge circulation"[T/A] #32 Facilitators[T/A] #33 Barriers[T/A] #34 "Process evaluation*"[T/A] #35 "Formative evaluation*"[T/A] #36 "Summative evaluation*"[T/A] #37 "Qualitative evaluation*"[T/A] #38 Sustainability[T/A] #39 Practicability[T/A] #40 Feasibility[T/A] #41 Fidelity[T/A] #42 Maintenance[T/A] #43 Adopt*[T/A] #44 Integrat*[T/A] #45 Disseminat*[T/A] #46 Promot*[T/A] #47 OR/ #21-46 #48 #20 AND #47
Context	#49 Hospitals[MeSH] #50 Hospital*[T/A] #51 "Emergency Service, Hospital"[MeSH] #52 ER[T/A] #53 Emergency room[T/A] #54 Emergency department[T/A] #55 ED #56 "Acute care"[T/A] #57 "Acute setting"[T/A] #58 Inpatient[T/A] #59 Inpatient setting[T/A] #60 Secondary Care[T/A] #61 Clinic[T/A] #62 OR/ #49-61 #63 #5 AND #48 AND #62

Population	#1 Dementia[MeSH] #2 Dement*[T/A] #3 Alzheimer*[T/A] #4 Cognitive impairment*[T/A] #5 OR/ #1-4
Concept	#6 Transitional Care[MeSH] #7 Transitional care[T/A] #8 Transitional care model[T/A] #9 TCM[T/A] #10 Transition*[T/A] #11 Care coordination[T/A] #12 Discharge management[T/A] #13 Continuity of Patient care [MeSH] #14 OR/ #6-13 #15 Implement*[T/A] #16 Health plan implementation[MeSH] #17 Implementation Science [MeSH] #18 "Quality improvement*"[T/A] #19 Quality improvement[MeSH] #20 Diffused[T/A] #21 Diffusion[T/A] #22 Diffusion of innovation[MeSH] #23 "Knowledge translation*"[T/A] #24 "Knowledge exchange"[T/A] #25 "Knowledge circulation"[T/A] #26 Facilitators[T/A] #27 Barriers[T/A] #28 "Process evaluation*"[T/A] #29 "Formative evaluation*"[T/A] #30 "Summative evaluation*"[T/A] #31 "Qualitative evaluation*"[T/A] #32 Sustainability[T/A] #33 Practicability[T/A] #34 Feasibility[T/A] #35 Fidelity[T/A] #36 Maintenance[T/A] #37 Adopt*[T/A] #38 Integrat*[T/A] #39 Disseminat*[T/A] #40 Promot*[T/A] #41 OR/ #15-40 #42 #14 AND #41
Context	#43 Hospitals[MeSH] #44 Hospital*[T/A] #45 Acute care [T/A] #46 Acute setting*[T/A] #47 Inpatient[T/A] #48 Inpatient setting[T/A] #49 Post acute[T/A] #50 Post acute setting[T/A] #51 Secondary care[T/A] #52 Clinic[T/A] #53 OR/ #43-52 #54 #5 AND #42 AND #53

Supplementary table 3: Coding categories for implementation strategies, ERIC[31-33]

Categories	Subcategories
Use evaluative and iterative strategies	▪ Assess for readiness and identify barriers and facilitators ▪ Audit and provide feedback ▪ Purposefully reexamine the implementation ▪ Develop and implement tools for quality monitoring ▪ Develop and organize quality monitoring systems ▪ Develop a formal implementation blueprint ▪ Conduct local need assessment ▪ Stage implementation scale up ▪ Obtain and use patients/consumers and family feedback ▪ Conduct cyclical small tests of change
Provide interactive assistance	▪ Facilitation ▪ Provide local technical assistance ▪ Provide clinical supervision ▪ Centralize technical assistance
Adapt and tailor to context	▪ Tailor strategies ▪ Promote adaptability ▪ Use data experts ▪ Use data warehousing techniques
Develop stakeholder interrelationships	▪ Identify and prepare champions ▪ Organize clinician implementation team meetings ▪ Recruit, designate, and train for leadership ▪ Inform local opinion leaders ▪ Build a coalition ▪ Obtain formal commitments ▪ Identify early adopters ▪ Conduct local consensus discussions ▪ Capture and share local knowledge ▪ Use advisory boards and workgroups ▪ Use an implementation advisor ▪ Model and simulate change ▪ Visit other sites ▪ Involve executive boards ▪ Develop an implementation glossary ▪ Develop academic partnerships ▪ Promote network weaving
Train and educate stakeholders	▪ Conduct ongoing training ▪ Provide ongoing consultation ▪ Develop educational materials ▪ Make training dynamic ▪ Distribute educational materials ▪ Use train-the-trainer strategies ▪ Conduct educational meetings ▪ Conduct educational outreach visits ▪ Create a learning collaborative ▪ Shadow other experts ▪ Work with educational institutions
Support clinicians	▪ Facilitate relay of clinical data to providers

	▪ Remind clinicians ▪ Develop resource sharing agreements ▪ Revise professional roles ▪ Create new clinical teams
Engage consumers	▪ Involve patients/consumers and family members ▪ Intervene with patients/consumers to enhance uptake and adherence ▪ Prepare patients/consumers to be active participants ▪ Increase demand ▪ Use mass media
Utilize financial strategies	▪ Fund and contract for the clinical innovation ▪ Access new funding ▪ Place innovation on fee for service lists/formularies ▪ Alter incentive/allowance structures ▪ Make billing easier ▪ Alter patient/consumer fees ▪ Use other payment schemes ▪ Develop disincentives ▪ Use capitated payments
Change infrastructure	▪ Mandate change ▪ Change record systems ▪ Change physical structure and equipment ▪ Create or change credentialing and/or licensure standards ▪ Change service sites ▪ Change accreditation or membership requirements ▪ Start a dissemination organization ▪ Change liability laws

Supplementary table 4: Coding categories for potential factors influencing the implementation processes, CFIR[34]

Categories	Subcategories
Intervention characteristics	▪ Intervention source ▪ Evidence strength and quality ▪ Relative advantage ▪ Adaptability ▪ Trialability ▪ Complexity ▪ Design quality and packaging ▪ Cost
Outer setting	▪ Patient needs and resources ▪ Cosmopolitanism ▪ Peer pressure ▪ External policy and incentives
Inner setting	▪ Structural characteristics ▪ Networks and communications ▪ Culture ▪ Implementation climate ▪ Tension for change ▪ Compatibility ▪ Relative priority ▪ Organizational incentives and rewards ▪ Goals and feedback ▪ Learning climate ▪ Readiness for implementation ▪ Leadership engagement ▪ Available resources ▪ Access to knowledge and information
Characteristics of individuals	▪ Knowledge and beliefs about the intervention ▪ Self-efficacy ▪ Individual stage of change ▪ Individual identification with organization ▪ Other personal attributes
Process	▪ Planning ▪ Engaging ▪ Opinion leaders ▪ Formally appointed internal implementation leaders ▪ Champions ▪ External change agents ▪ Executing ▪ Reflecting and Evaluating